

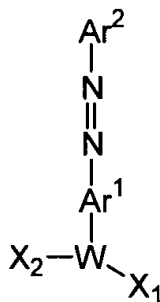
This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

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1-26. (Canceled)

27. (Currently Amended): A ~~quencher-phosphoramidite reagent~~ compound having the formula:



wherein

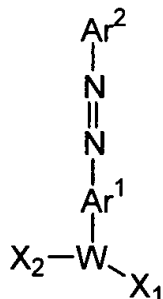
$\text{Ar}^1$  and  $\text{Ar}^2$  are each independently a substituted or unsubstituted aryl group;

$\text{X}_1$  is selected from the group consisting of OH, O-dimethoxytrityl, O-methoxytrityl, O-trityl and an oxygen atom having an acid labile blocking group;

$\text{X}_2$  is a moiety ~~reactive towards nucleophiles~~ phosphoramidite; and

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof.

28. (Currently Amended): A ~~quencher-phosphoramidite reagent~~  
compound having the formula:



CI  
COO<sub>4</sub> wherein

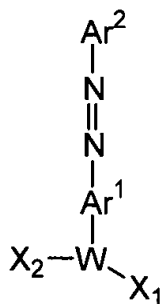
Ar<sup>1</sup> and Ar<sup>2</sup> are each independently a substituted or unsubstituted aryl  
group;

X<sub>1</sub> is selected from the group consisting of H, (C<sub>1</sub>-C<sub>12</sub>)alkyl, aryl,  
heteroaryl, and protected or unprotected functional group;

X<sub>2</sub> is selected from the group consisting of a phosphorous coupling  
moiety, a pentafluorophenoxy moiety and a succinimidyl moiety; and

W is a linking group having from 3 to 100 backbone atoms selected from  
C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination  
thereof.

29. (Currently Amended): A ~~quencher-phosphoramidite reagent~~  
compound having the formula:



wherein

$\text{Ar}^1$  and  $\text{Ar}^2$  are each independently a substituted or unsubstituted aryl group;

$\text{X}_1$  is selected from the group consisting of H,  $(\text{C}_1\text{-C}_{12})$ alkyl, aryl, heteroaryl, and protected or unprotected functional group;

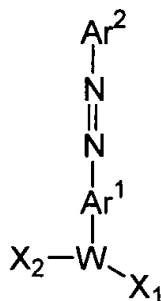
$\text{X}_2$  is a phosphoramidite; and

$\text{W}$  is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof.

30. (Canceled)

31. (Canceled)

32. (Currently Amended): A quencher-phosphoramidite-reagent compound having the formula:



wherein

$\text{Ar}^1$  and  $\text{Ar}^2$  are each independently a substituted or unsubstituted aryl group;

$\text{X}_1$  is selected from the group consisting of H,  $(\text{C}_1\text{-C}_{12})$ alkyl, aryl, heteroaryl, and protected or unprotected functional group;

$\text{X}_2$  is a moiety reactive towards nucleophiles;

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof; and

wherein one of Ar<sup>1</sup> and Ar<sup>2</sup> is directly or indirectly substituted with a substituted aryl group (Ar<sup>3</sup>), where Ar<sup>3</sup> extends the resonance ability of the Ar<sup>1</sup>-N=N-Ar<sup>2</sup> aromatic system and thereby increases the wavelength absorbance maximum of the compound.

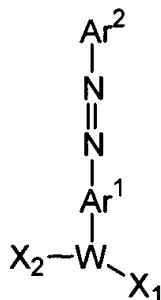
C<sup>1</sup>  
C<sub>60</sub>-t.  
33. (Previously Added) A compound of claim 32 wherein Ar<sup>1</sup> is directly substituted with Ar<sup>3</sup>.

34. (Previously Added) A compound of claim 32 wherein Ar<sup>1</sup> is indirectly substituted with Ar<sup>3</sup>.

35. (Previously Added) A compound of claim 32 wherein Ar<sup>2</sup> is directly substituted with Ar<sup>3</sup>.

36. (Previously Added) A compound of claim 32 wherein Ar<sup>2</sup> is indirectly substituted with Ar<sup>3</sup>.

37. (Currently Amended): A quencher-phosphoramidite-reagent compound having the formula:



wherein

Ar<sup>1</sup> and Ar<sup>2</sup> are each independently a substituted or unsubstituted aryl group;

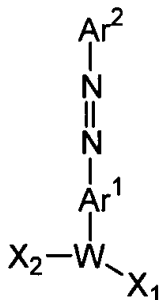
X<sub>1</sub> is selected from the group consisting of H, (C<sub>1</sub>-C<sub>12</sub>)alkyl, aryl, heteroaryl, and protected or unprotected functional group;

X<sub>2</sub> is a phosphoramidite;

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof; and

CI  
cont  
wherein Ar<sup>1</sup> or Ar<sup>2</sup> is indirectly substituted with Ar<sup>3</sup> through a group selected from  $-(C\equiv C)_n-$  and  $-(CR'=CR')_n-$  where n is 0 to 5 and R' is independently selected from hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl and heteroalkyl, unsubstituted aryl and heteroaryl, (unsubstituted aryl)-(C<sub>1</sub>-C<sub>4</sub>)alkyl, and (unsubstituted aryl)oxy-(C<sub>1</sub>-C<sub>4</sub>)alkyl.

38. (Currently Amended): A ~~quencher-phosphoramidite reagent~~ compound having the formula:



wherein

Ar<sup>1</sup> and Ar<sup>2</sup> are each independently a substituted or unsubstituted aryl group;

X<sub>1</sub> is selected from the group consisting of H, (C<sub>1</sub>-C<sub>12</sub>)alkyl, aryl, heteroaryl, and protected or unprotected functional group;

$X_2$  is a phosphoramidite;

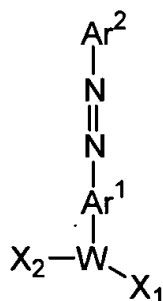
W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof; and

$Ar^1$  or  $Ar^2$  is indirectly substituted with  $Ar^3$  through a double bond selected from carbon-carbon and nitrogen-nitrogen double bonds.

39. (Canceled)

40. (Canceled)

41. (Currently Amended): A ~~quencher-phosphoramidite reagent~~ compound having the formula:



wherein

$Ar^1$  and  $Ar^2$  are each independently a substituted or unsubstituted aryl group;

$X_1$  is selected from the group consisting of H,  $(C_1-C_{12})$ alkyl, aryl, heteroaryl, and protected or unprotected functional group;

$X_2$  is a phosphoramidite;

W is a linking group having from 3 to 100 backbone atoms selected from C, N, O, S, Si and P, said linking group being cyclic, acyclic, aromatic or a combination thereof;

wherein one of Ar<sup>1</sup> and Ar<sup>2</sup> is directly or indirectly substituted with a substituted aryl group (Ar<sup>3</sup>), where Ar<sup>3</sup> extends the resonance ability of the Ar<sup>1</sup>-N=N-Ar<sup>2</sup> aromatic system and thereby increases the wavelength absorbance maximum of the compound; and

at least one of Ar<sup>1</sup>, Ar<sup>2</sup> and Ar<sup>3</sup> is substituted with -halogen, -OR', -OC(O)R', -NR'R'', -SR', -R', -CN, -NO<sub>2</sub>, -CO<sub>2</sub>R', -CONR'R'', -C(O)R', -OC(O)NR'R'', -NR''C(O)R', -NR''C(O)<sub>2</sub>R', -NR'-C(O)NR''R''', -NH-C(NH<sub>2</sub>)=NH, -NR'C(NH<sub>2</sub>)=NH, -NH-C(NH<sub>2</sub>)=NR', -S(O)R', -S(O)<sub>2</sub>R', -S(O)<sub>2</sub>NR'R'', -N<sub>3</sub>, -CH(Ph)<sub>2</sub>, perfluoro(C<sub>1</sub>-C<sub>4</sub>)alkoxy, and perfluoro(C<sub>1</sub>-C<sub>4</sub>)alkyl, in a number ranging from zero to the total number of open valences on the aromatic ring system; and where R', R'' and R''' are independently selected from hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl and heteroalkyl, unsubstituted aryl and heteroaryl, (unsubstituted aryl)-(C<sub>1</sub>-C<sub>4</sub>)alkyl, and (unsubstituted aryl)oxy-(C<sub>1</sub>-C<sub>4</sub>)alkyl.

42. (New) A compound of claim 27 wherein W is acyclic.
43. (New) A compound of claim 27 wherein W comprises a cyclic group.
44. (New) A compound of claim 28 wherein W is acyclic.
45. (New) A compound of claim 28 wherein W comprises a cyclic group.
46. (New) A compound of claim 29 wherein W is acyclic.
47. (New) A compound of claim 29 wherein W comprises a cyclic group.

48. (New) A compound of claim 32 wherein W is acyclic.
49. (New) A compound of claim 32 wherein W comprises a cyclic group.
50. (New) A compound of claim 33 wherein W is acyclic.
51. (New) A compound of claim 33 wherein W comprises a cyclic group.
- CI  
Cot. 52. (New) A compound of claim 34 wherein W is acyclic.
53. (New) A compound of claim 34 wherein W comprises a cyclic group.
54. (New) A compound of claim 35 wherein W is acyclic.
55. (New) A compound of claim 35 wherein W comprises a cyclic group.
56. (New) A compound of claim 36 wherein W is acyclic.
57. (New) A compound of claim 36 wherein W comprises a cyclic group.
58. (New) A compound of claim 37 wherein W is acyclic.



59. (New) A compound of claim 37 wherein W comprises a cyclic group.

60. (New) A compound of claim 38 wherein W is acyclic.

C1  
605.4. 61. (New) A compound of claim 38 wherein W comprises a cyclic group.

62. (New) A compound of claim 41 wherein W is acyclic.

63. (New) A compound of claim 41 wherein W comprises a cyclic group.

64. (New) A compound of claims 28, 32-36 or 48-57 wherein  $X_2$  is a phosphoramidite.

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